

11 Sound and Video Editing

11.1 Video compression

- Video files can be compressed by lossless or lossy compression
- Lossy compression doesn't lose any data during compression while lossless compression does
- There are many factors that affect the file size of a finished video, with one being the number of **pixels used for the product**
- The size of standard definition file (SD) is 720x480, a high-definition file (HD) is 1920x1080 and a 4k ultra high-definition file (UHD) is 3840x2160
- The higher the definition of the file, the higher the number of pixels per frame required to store and stream it
- **Length of the video** also affects the file size, shorter videos require less storage space and streaming time
- Another factor is the **number of frames per second (fps)**
- Most videos are set at 30 fps, and if it's lowered to 15 fps then the video will require half of the original storage capacity and time taken to stream it
- Compressed videos are stored in a container like, .mp4, .wmv, .avi and so on
- The software used to display the video must recognize the container holding the video and understand the codec used to encode the video within the container
- The same codec must be used in the software to decode the video
- If the codec isn't present in software, then the video within the container won't play
- Codec is short for coder/decoder and is a program that knows how to handle video when stored in a particular format
- It is used to compress and decompress the data for or from data transmission
- Data might be compressed so that it can be shown on a phone with a small display (426x240)
- If this compressed video was displayed on a UHD monitor or television, it would be very pixelated and almost unviewable
- It is therefore critical that the correct container and compression method is selected when data is saved
- Unless storage space and bandwidth for streaming are very limited, always select a lossless format

11.2 Video editing

Trimming And Cropping A Video Clip

- Trimming is when the start or end of the video clips are removed while cropping is when selected parts from the video clip are removed, they both serve similar purpose
- Video can be trimmed by positioning cursor on the timeline over the start or end point
- When the trim handle appears then drag the handle to trim the clip
- It is used to remove unwanted footage from a video from the start or end to make it less boring
- It is used to shorten the length because it is too long or to reduce file size
- It is used to bring video and audio into synch so that video looks more natural
- It is used to make it more exciting by removing boring introduction

Create Text Based Slides

- Text based slides is done to add text to video which engages the audience and helps them retain the video content better

Create Credits

- Credits are used to inform viewers about the people involved in the creation of the video.
- They are a way of acknowledging the help, support and contributions made by people in the making of the video
- Opening credits are shown at beginning and closing credits at the end, in shorter videos, all credits are placed at end of the video
- The purpose is to inform viewers who was involved in the production of the video
- It usually includes production details like filming location, date and so on

Add Captions and Subtitles

- To add captions or subtitles, select the style required, right-click it and select the position where it needs to be placed
- Then select the start of the video track to the end of the video track to the title track
- Then double-click the title frame in the preview window and type or paste the text
- What has been said is shown on the screen so that nothing is missed
- To provide additional information for better understanding for the viewers
- Viewers of a video may have hearing difficulties so subtitles help understand what is being said

- There may be a lot of background noise where the video is being watched so that nothing is missed.
- Video may be viewed in a quiet area having the audio on would bother other people
- People watching the video might speak a different language so subtitles in same or other languages can be provided

Add Fading Effects

- The video may have a start and end that may feel very abrupt
- Fading can make it look smoother by adding a fade-in effect for the beginning and fade-out effect for the end
- It gives your video a more professional look and feel
- It is sometimes used because the video creator wishes to ease the audience's emotions after a troubling scene
- It may be used to indicate that a period of time has passed between two scenes
- This can be achieved by fading out first scene and fading in to next scene, a longer fade indicates a longer time interval such as days or months

Extract A Still Image From A Video Clip

- a still image maybe be extracted from a video clip that is a particular frame of a video because it might make a wonderful photograph album
- another reason is that you might want to edit or add other graphics to the image using a graphics package before reinserting it back into the video

Insert A Still Image

- Reason for inserting a still image are similar to those for extracting still images
- It could be used to include a nice a photograph in the video, which would enhance it greatly

Add Sound To A Video Clip

- To add sound, open the video and audio files that needs to be merged in an appropriate editing software
- Then drag the added files to the corresponding tracks on the timeline board
- The video file would be placed on the video track and the audio file on the audio track

- It can invoke an emotional response from the viewer to increase engagement
- To grab audience attention by making the video more interesting
- A narrator can provide further content to drive home the emotion/mood/can clarify a video
- To add sound effect can heighten the impact of e.g. explosions to add authenticity/context/reality
- To add a clear soundtrack without background noise

Export A Video Clip In Different File Formats

- Not all video formats are compatible with particular device or platforms and hence those videos can't be played on them
- Videos may also need to be converted to reduce their file size to allow them to be attached to an email or to reduce their storage space
- The compression algorithm that particular formats use can be different and so the file may need changing, .mov and .avi are examples of it

Compress A Video To Different Resolutions

- Resolution can be set for a video, which is the number of pixels in width in comparison with the number of pixels in height
- Conversion to different resolution may be required because different platforms require different resolution, depending on how large the image will be when displayed and the quality required
- A smaller resolution video tends to be of lower quality and gets distorted when played in a platform that requires higher resolution
- The standard high definition (HD) resolution is 1920 x 1080 and standard definition (SD) is 640 x 360

11.3 Audio editing 8

Trimming A Sound Clip

- It cuts part of the sound out reducing the length of the track
- Trimming a sound clip might be required to match it with the timing of a video that you intend to add the sound to

- It reduces the file size and enables unwanted sounds to be removed

Splice/Join Together Two Sound Clips

- Splicing is when a sound clip is cut up into different parts then joined back together with only the required parts
- It allows it allows to cut it parts in a sound clip that you do not want and join the ones you want
- Splicing/joining could be to use to make two recordings flow uninterrupted into another
- Another could be that we want to combine the best parts from several recorded performances of the same act

Fade In and Fade Out A Sound Clip

- Fade in occurs at the beginning of a sound clip when the sound gradually gets louder
- Fading in is necessary when there is a clear section of silence prior to the sound track
- Fading is used to soften the introduction of a drum/percussion instrument
- Fade out occurs towards the end of a sound clip when the soft gradually gets softer
- Fading out is a recording solution for pieces of music that contain no obvious ending
- Volume stops increasing when the required sound level is reached
- There may be a need to clear out a section of silence before the audio starts
- Sound disappears altogether

Normalise A Sound Clip

- If an audio file is converted from analogue to digital using a faulty device hen it will appear to have offset waveform which would require normalizing
- The offset wave wouldn't be centered along the 0 line like normally
- It also has an effect of amplifying both channels
- One problem when using normalization is called clipping this is when sounds get so loud they get distorted.

Applying Noise Reduction

- It is applied to reduce background sounds that are constantly present like a buzz or hiss
- It is applied to improve the quality of the sound for the listener

- It wouldn't be suitable for individual clicks and pops or irregular sounds such as a from traffic or an audience

Overdubbing To Include A Voice Over

- It is usually done by adding extra instruments to a music track to give it a richer, fuller sound
- It means putting other tracks on to existing
- It is often used when a voiceover is needed to explain the contents of an existing sound track

Export Sound Clip In Different File Formats

- Exporting sound clips in different file formats is done to make it compatible with other devices and software.
- If the file format is compatible with the device or platform, the sound clip won't be played on it in that format
- They can be used to reduce the file size to allow for compression
- They can be used to increase the file size to allow for an increase in sound clip data such as adding a voiceover will increase existing file size
- .mp3 and .m4a are lossy formats where sound quality isn't always as good as the original recording.
- Both .aac and .m4a are more efficient coding format than .mp3
- In most cases, the file sizes for these formats are smaller but give the same quality of audio file
- .wav file format is a container that often contains lossless files, although it can contain lossy data too

Compressing Sound File

- Lossless compression retains the quality of the original audio file
- Data isn't lost
- When lossless compression software sees a repeated sequence of bits, it replaces the repeated sequence with a character which indicates what is being repeated and how many times
- Lossy compression removes some of the audio files data
- It reduces the quality of the audio file

- It removes sounds at very low and high frequencies that are outside human hearing range
- creates smaller file sizes than lossless compression
- once this data has been removed from the files it can never be replaced
- it allows large files to be streamed/uploaded/downloaded or stored

11.4 Sampling rate and sampling resolution

Sampling Rate

- Digital audio is a series of discrete bursts called samples
- The frequency that these samples occur is so fast it sounds like a continuous sound
- The sampling rate is the number of samples within a given period of time
- The higher the sampling rate, the more accurately the original sound can be represented and the better it sounds
- Each sample uses up storage space so the lower the sampling rate, the lower the number of samples in a file and hence lower storage capacity being required
- Bigger files require more computing power to process
- The human ear is limited regarding in the frequencies it can detect (20kHz))
- There is a minimum rate at which samples need to be taken in order to faithfully reproduce the original signal
- Decreasing sampling rate can lead to distortion of sound and reducing the sound quality

Sampling Resolution

- Sampling resolution is the number of bits per sound sample
- the higher the sampling resolution, the more accurately the wave form of the sound will be converted from analogue to digital
- The higher the sampling resolution, the greater the file size
- The standard for compact disc audio and many sound cards are 16 bits
- Modern day digital audio is normally found in 16 bit/24 bit resolutions
- 8 bit resolution was used in the earliest sound cards and is used for some lower quality recording formats
- ^ It can take one of 256 different values which is not generally considered enough resolution to accurately represent music audio

- The difference between 24 and 32 bit is beyond human hearing capacity
- The frequency for each sample is stored in a number of bits called sampling resolution or bit depth which is the number of bits per sound sample
- Each additional bit doubles the number of values that can be stored
- These values are all per channel
- For stereo audio two channels are needed
- This doubles the sampling and memory requirements

11.5 Audio compression

- Some audio compression called dynamic compression works by reducing a signal's dynamic range
- This is the range between the loudest and quietest parts of an audio signal
- Compression work by quietening the loudest parts of the signal and then boosting the results so that all the quieter parts become slightly louder and loudest parts slightly quieter
- The waveform of a compressed signal appears to be more compressed than original but this usually give better sound quality
- Two main types of compression are lossy and lossless
- Lossless compression doesn't reduce the quality of file
- Data isn't lost so the audio file can be reconstructed as it was when originally created
- There are a number of algorithms used to perform the and most look for repeating patterns of data
- Lossy compression removes some of the audio file's data and reduces the quality of the audio file but it creates smaller file size than lossless compression
- Removed data via lossy compression can't be recovered
- Sounds that are outside human hearing range are removed in lossy
- Most audio files are stored and streamed in containers
- Even lossless formats like .wav files are containers that store the audio data, sample rate, sampling resolution and track numbers
- Many lossy containers contain the audio files and meta tags which indicate which codec/s can be used to decode the audio as well as the name of the artist, track, track number and so on